

ABSTRACT

Process for producing a tool insert for injection molding a microstructured part fabricated of a synthetic material, a metal or a ceramic material and which comprises an arrangement of microchannels and which further comprises an arrangement of through-going orifices extending in a substantially perpendicular manner with respect to the outer surface of the part. The process comprises the following steps:

- (1) microstructuring the front side of a first wafer by means of plasma etching to form the arrangement of microchannels, which are formed on the front side of the wafer,
- (2) removing the etching mask from the front side of the first wafer,
- (3) microstructuring the rear side of the first wafer by means of plasma etching to form the arrangement of through-going orifices which extend in a substantially perpendicular manner with respect to the front side of the first wafer,
- (4) removing the etching mask from the rear side of the first wafer,
- (5) bonding the rear side of the first wafer to a carrier substrate to form a master,
- (6) electrochemically depositing a metal layer on the front side of the first wafer and in the through-going orifices which are present therein, wherein the deposited metal layer achieves a depth which is greater than the depth of the microchannels on the front side of the first wafer, and
- (7) separating the metal layer from the master, wherein the separated metal layer can be used as a tool insert for injection molding a part and has integrated in the metal layer piercing punches, each such punch having a shape and dimensions defined by the shape and dimensions of a corresponding one of the through-going orifices provided in the first wafer.